

## Pharmacoeconomics: Need for the day

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### **Abstract**

*Health economics shed's light on the concept of making decisions about resource allocations at the time of scarcity of resources and increased demand, by evaluating the rationale of choices in terms of their cost and benefit. Pharmacoeconomics is one of the strongest pillars of health economics to make the allocation decisions with respect to the medicines and there by ensure that society allocates minimal health care resources wisely, fairly, and efficiently. Two major components of any pharmacoeconomic evaluation are cost and consequences and using pharmacoeconomic principles, methods and theories into practice, for quantifying the value of pharmacy products and pharmaceutical care services utilized in real world environment is one of the major applications of pharmacoeconomics. The key reason for studying pharmacoeconomics is to be able to estimate, understand and interpret the complete impact of a drug therapy. Such an impact would be shown on individual's health, safety, their use of health care services, cost of health care, quality of life, functional status and on society as a whole. The price of drug therapy will be then justified based on its impact on broad range of outcomes.*

**Key words:** *Pharmacoeconomics, cost, consequences, health care, benefit*

### **INTRODUCTION**

In India because of growing pressure on the healthcare budget, appropriate justification of current expenditures and future investments in public healthcare are becoming a priority. Pharmacoeconomic analyses are one means of justifying and minimizing these expenditures. Health care professionals must be able to create a balance between the needs and desires of individual patients with the needs and desires of society at large. Comparing the expected benefits of a medical intervention against the expected cost of that intervention along with the health care benefits many times is difficult to interpret, in such a scenario pharmaco-economic studies helps to ensure that society allocates minimal health care resources wisely, fairly, and efficiently.

#### **Cost and Consequences (Outcome)**

Two major components of any pharmacoeconomic evaluation are cost and consequences (outcome). Cost is the total value of resource consumed for drug therapy of interest or related services. Consequence is the outcome of drug therapy of interest or related services. Assessment of cost and consequence depends mainly on two perspectives – Patient and Provider.<sup>1</sup>

In patient's perspective it will be the health care services received where costs include co-payments,

transportation, loss of income and consequences include relief of symptoms, cure, and quality of life. This outlook is more subjective because it includes patient preferences and less common in the empirical literature. Provider's Perspective includes health care services delivered. Costs here will be in terms of personnel, supplies and consequences will be measured as length of stay, mortality, morbidity. This perspective depends on capitation and managed care penetration.<sup>2</sup>

To help decision making regarding a drug therapy, the pharmacoeconomic evaluation should include an assessment of the economic, clinical and humanistic outcomes. (i.e., ECHO model). Sometimes the consequences are grouped as positive and negative where desired effect or efficacy of the drug will be a positive outcome and adverse drug reaction or treatment failure will be a negative outcome.<sup>2</sup>

#### **Pharmacoeconomic techniques**

**Cost-of-illness analyses:** Identifies and measures the costs of the illness itself but not treatment outcomes.

**Cost-benefit analyses:** Measures the costs of treating an illness, along with monetary equivalents that provide the same outcome, with the ultimate aim of identifying the most economic option.

**Cost-effectiveness analyses:** Measures the costs of treating an illness, by using clinical measurements which involve the comparison of cost per standardized unit of effectiveness, such as cost per life saved or cost per

hospitalization avoided for two or more interventions that provide varying outcomes.

**Cost-utility analyses:** Measures the costs of treating an illness in terms of their social value, expressed in incremental measures or preference equivalents (QOL, QALY) for the treatment's outcomes.

**Cost-minimization analyses:** Directly compares the costs of treatment options for an illness, assuming equivalence of their outcomes.

Using Pharmacoeconomic principles, methods and theories into practice, to quantify the value of pharmacy products and pharmaceutical care services utilized in real world environment is major application of Pharmacoeconomics.<sup>3</sup>

**Modelling and sensitivity analysis**

Lack of cost and consequences data for many complicated health care interventions presents with problems of interpretation, these problems can sometimes be solved by using clinical and economic modelling most common being decision trees and Markov models. A decision tree maps out the alternative being compared in as much detail as possible. Usually starts with a decision node and subsequently probability nodes show the chances of each possible consequence occurring.

A range of interventions and their possible consequences can be mapped out clearly in a decision tree. Once options are clear,<sup>4</sup> probabilities can be attached to them either using new trial data or existing information.

Sensitivity analysis is the act of changing assumptions about the value or probability of costs and consequences, to determine whether the results of an evaluation are

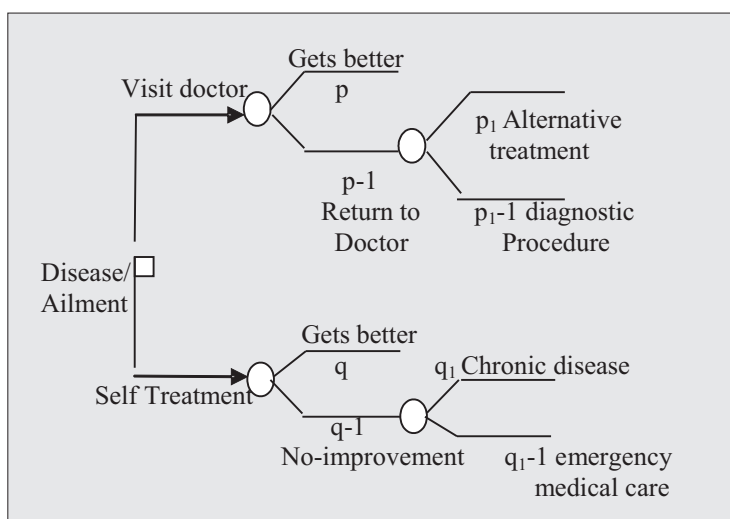
sensitive to such changes or not. Markov models are helpful when decision trees are not sufficient such as in case of chronic diseases and complex interventions where same decisions recur constantly.<sup>4</sup>

**Limitations**

Numerous limitations exist when pharmacoeconomic studies are put into practice. Entire process may be biased with respect to choice of comparator drug, assumptions made or reporting of results. Since most studies are conducted or funded by pharmaceutical companies who are keen on the results,<sup>5</sup> there exists a publication bias towards those studies favorable to sponsoring companies. Pharmacoeconomics hence is misused sometimes as a marketing tool.<sup>6</sup>

Similar problems may arise in studies funded by health care payers (Insurance companies). Doctors may have the tendency to equate pharmacoeconomics with cost cutting, and hence reject on principle as unethical.

One of the major problems is ability to implement the results of a study. Irrespective of how good a study is, and how cost effective a therapy is when compared to existing treatment, it may not be possible to achieve its potential benefits because of the existing management structures. Management authorities have a short term outlook which limits the application of pharmacoeconomic evaluations showing long term savings for the health service in return for increased spending.<sup>7</sup> Many budgets operate in isolation, and it is not easy to move money between them and a new intervention may not be affordable no matter how cost effective it might prove to be.



## SUMMARY

Various methodological advances have been implemented to make available the tools that are necessary to measure comprehensive outcomes; which includes Strategies for collecting pharmacoeconomic data. Using psychometric techniques, tools for measuring changes in general and disease specific health status have been developed and validated.<sup>8</sup> Frequentist and Bayesian approaches are preferred for designing as well as analyzing of a clinical trial and observational data to use in Pharmacoeconomic evaluations. Individuals or organizations who are involved in health care decision making such as, pharmaceutical companies, medical device companies, consumers of such products and health care providers<sup>9,10</sup> should have a through knowledge of various elements of Pharmacoeconomic analysis to be able to understand the interpretation in terms of result.

The key reason for studying pharmacoeconomics is to be able to estimate, understand and interpret the complete impact of a drug therapy. Such an impact would be shown on individual's health, safety, their use of health care services, cost of health care, quality of life, functional status and on society as a whole. The price of drug therapy will be then justified based on its impact on broad range of outcomes.

Economic evaluations of drug therapy are increasingly important in decision making. Health care providers should welcome this as a means to promote efficiency and effectiveness of prescribing, and aim to move the debate away from pure cost to value for money in prescribing. This tool can be effectively used in drug evaluation & formulary decisions in hospitals, clinical guidelines & drug use policy development, supporting pricing decisions for new products, service or program evaluation.

To improve upon the existing knowledge and practice of pharmacoeconomics; more education has to be provided and workshops to health professionals, decision makers & medical representatives on should be conducted on: Various pharmacoeconomic study designs, literature of Pharmacoeconomic studies, modeling studies including decision analysis, sensitivity analysis and markov modeling, pharmacoeconomic courses incorporation in the curriculum. In spite of the complexity of the subject it is need for the day more so because the new age has numerous drug therapies and devices being launched everyday

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